

College Algebra Day 1
Sections 1.1-1.3

1.1 Numbers, Data and Problem Solving

Our Number System

Order of Operations

Example: Evaluate $\frac{-5^2 - 20 \div 4 - 2}{|9 - 11|^3 \div 16 \cdot 2}$ by hand.

Scientific Notation

Example: Evaluate $\frac{9.8 \times 10^{-6}}{2 \times 10^{-8}}$ by hand and write answer in scientific notation

Problem Solving:

Determining the speed of Earth in mph.

The Volume of a soda can.

Thickness of an object: $T = \frac{V}{A}$

T = thickness of object, V = volume of object, A = area of object

Percent Change: $P = \frac{N - O}{O} \times 100$

N = new amount, O = old amount, P = percent change

Example: The University of Tennessee announced an in-state undergraduate tuition increase from \$407 to \$534 a year. What is the percent increase in tuition?

Example: The flow rate from the BP oil spill in the Gulf of Mexico could be as high as 16,000 cubic meters per day. Suppose the oil has a thickness of 30 centimeters. In one day, how much area does the oil spill cover?

Section 1.2 Visualizing and Graphing Data

One-Variable Data

Example: The height of a person selected at random is shown in the table below:

Height (in inches)	60	69	66	72	74	64
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- (a) Find the mean height
- (b) Find the maximum and minimum height
- (c) Find the median and interpret the result

Two-Variable Data

Example: The average annual precipitation by month in Austin, Texas is shown in the table below, where 1 corresponds to January, and so on.

Month	1	2	3	4	5	6	7	8	9	10	11	12
Precipitation (inches)	1.89	1.99	2.14	2.51	5.03	3.81	1.97	2.31	2.91	3.97	2.68	2.44

Ordered Pairs of numbers

Relations

Definition:

Domain and Range

Graphing a Relation

Scatterplots

The Distance Formula

Example: Find all points on the x -axis 10 units away from the point $(3,4)$

Midpoint Formula

Circles

Definition:

Equations of circles:

Example: Write the following equation of a circle in standard form, then determine the center and radius. Sketch a graph

$$x^2 + y^2 - 4x + 6y - 10 = 0$$

Example: Find an equation for the circle with a diameter whose endpoints are $(-3, 8)$ and $(4, -2)$. Sketch a graph of this circle

Section 1.3 Functions

Definition:

Domain and Range

Heat-wave handout

Function Notation $y = f(x)$

Representations of functions:

Verbal

Numerical

Symbolic

Graphical

Function Workout Handout